

while watching these efforts it was difficult not to believe that there existed some structural modification of the genitalia which prevented copulation, for as soon as an insect was given a mate of the same species copulation was instantaneously effected. Only one pairing between *Z. filipendulae* ♀ and *Z. lonicerae* ♂ was obtained. It lasted a normal time and the female laid nearly 300 eggs, most of which were fertile.

I had also a few *hippocrepidis* and *trifolii*, and obtained pairings between a *hippocrepidis* ♀ × *trifolii* ♂, *hippocrepidis* ♀ × *lonicerae* ♂, and *lonicerae* ♀ × *hippocrepidis* ♂. The first two females laid eggs which were infertile. The last pairing only lasted five minutes, and no eggs were laid.

The larvæ of the first cross fed well and hibernated successfully, but owing to a heart-rending accident were all killed just before they began to feed up. A similar attempt was made in 1917, and three pairings were obtained between *filipendulae* and *lonicerae*, but none of the eggs were fertile.

On the other hand no great difficulty was found in obtaining pairings between *trifolii* ♀ and *lonicerae* ♂, which proved fertile.

If any reader were to find five-spot and six-spot burnets in copula, he would be conferring the greatest favour if he would place the insects in a cardboard box lined with moist filter paper firmly sewn to the sides, and would send them to the author, at 3, Selwyn Gardens, Cambridge. The material is required for genetic research work.

[Unfortunately the above did not reach us until after the July number was published, and hence the request is probably too late for the present season.—H.J.T.]

---

### Field Notes from Macedonia, 1918. I.

By CAPTAIN M. BURR, D.Sc., F.E.S., Etc.

The following few observations are the continuation of a little series of "Field Notes from Salonika," which appeared in the *Entomologist's Record* during 1916. Unfortunately, the collection of Orthoptera made in that year was destroyed in the great fire that ravaged Salonika in August last year, together with a quantity of other things that I valued. In 1917, partly from lack of time, and partly from lack of energy, I looked for little, took less, and lost that. All I have to show for last year is the record of a second, as yet unidentified, species of *Acrometopa*, which I found, together with *A. macropoda*, in one of the numerous gulches that split the hills on the right bank of the Struma valley; this second species differs from *A. macropoda* in the decidedly bluish tinge of its colour, in the shorter elytra, which are rounded at the apex, and not obliquely truncate, and the wings do not project beyond them.

It is not gratifying to have spent two and a half summers in so interesting and unworked a country as Macedonia, and to have little or nothing to show for it, so I have resolved for the rest of the present season to do as much collecting as time and circumstances permit. It is very desirable to make some observation on the habits of these creatures, and to make long series of the species which are abundant here, but unknown in other districts.

By the second half of February it really seemed that spring had begun; we had enjoyed some five or six weeks of fine sunny weather, broken by occasional sand storms, varied with blizzards. On February

11th, *Colias edusa* was flying freely on the rocky hillsides at the back of Lembet village, and the stones were crowded with a little fluffy black moth, folding its wings penthouse fashion, with strongly pectinate antennæ; mauve and yellow crocuses were springing up all around, and the Egyptian Vulture was soaring overhead, while Partridges and Crested Larks were beginning to discuss their domestic arrangements in the fields.

But a month of wild weather followed; it was not until March 19th that I saw the first hibernated grasshopper, the inevitable *Epacromia*, on the wing; *Pieris brassicae* was flying, and big ants had made their appearance. *Gryllus domesticus* was chirping in our field kitchens, and the Stone Curlew giving his weird whistle in the plains around. On March 28th a violent blizzard stripped all the fruit trees of their blossom, yet two days later I saw one benumbed Swallow.

By the end of April the weather was milder again, and immature dull black crickets, probably *G. burdigalensis*, were swarming on the banks of the Struma. *Epacromia* and *Acridium aegyptium* were flying freely. On May 4th, *Papilio machaon* and *P. podalirius*, and a handsome *Thais*, were flying freely, Lycaenids were numerous, and a fairly advanced female *Poecilimon* was picked up near Deve Kran. On the 26th, among the thorn thickets and glades on the north side of Lake Beshik, *Thais* and *Limenitis camilla* were observed; the delicate *Nemoptera coa*, apparently a prey for all raptorial insects, was fluttering helplessly about, and huge horse-flies with great emerald-green eyes, pestered our animals. On an excursion for a few days to the monasteries on Mt. Athos, I was struck by the richness of plant-life, but by the apparent poverty of the fauna; I noticed no Orthoptera, and practically no Lepidoptera, except a couple of *Gonepteryx cleopatra*.

On June 10th, *Glyphanus heldreichi*, Br., was mature at Mikra. On the 18th there were clouds of immature (Edipodids and Acridiids on the rocky hills between Lembet and Derbend, and I saw the richly contrasted black and yellow *Ascalaphus kolyranensis* dash past; in a mulberry orchard at Derbend there was a colony of *Olynthoscelis*: I took an adult male, which seems to be *O. chabrieri* or else one of the closely related species. I had previously been struck by the scarcity of this genus here, for it is abundantly represented in the more northern Balkan countries, and in past years I have taken several species in Wallachia, Hercegovina, Montenegro, and Dalmatia. On June 4th, Mr. F. H. Wolley-Dod called, and we climbed together to the top of a jagged peak in the neighbourhood of my camp, where we saw several *Melanargia*, the first which he had observed out here. *Glyphanus* was common, but all specimens from the rocks were of a slaty-blue colour, quite different from the brown ones from the sandy plains; perhaps this is Brunner's second species. *Arcyptera flavicosta* was freshly adult, as also the purely Macedonian *Gampsocleis abbreviatus*, Br., an active and ferocious Decticeid, which has been referred to in previous notes in these pages. The red-winged form of *Celes variabilis* was numerous, and *Platyceles*, of the *P. grisea* group was swarming, probably representatives of several species. *Decticus albifrons* is a very conspicuous insect out here, his loud and self-asserting stridulating calling attention to himself on all sides in dry grass and scrub. On June 23rd Captain Campbell, R.A.M.C., brought me a fine series of

the slaty-blue *Glyphanus* from the rocks, but he is not yet able to throw any light on the lemon-yellow and bright blue thigh-linings, brick-red occiput and ultramarine neck-membrane, which are not visible when the creature is in a normal attitude. On June 30th, Major Burstal, R.A.M.C., showed me specimens recently collected by him at Karaburun; these included practically all species mentioned hitherto, with the addition of several fine *Saga vittata*, F. de W., and another splendid species without the white stripes of *S. vittata*, and very decidedly larger; this veritable tiger of the Orthoptera-world is very likely *S. ephippigera*, so far recorded, to the best of my memory, only from Constantinople and Castellastua in Dalmatia, where, in 1901, I went in the hope of finding it, but without success. In the mess tent, after dinner, the characteristic short, sharp buzz, ending abruptly on a higher note, attracted my attention to a fine fresh male *Aerometopa macropoda*, Ser. The next evening I saw the first adult *Caloptenus italicus*, L., and in my hut found an adult male *Olynthoscelis chabrieri* (?) which had strayed in from goodness knows where.

(To be continued.)

---

## Mosquitoes and Malaria. 2.

(The following further notes have been received).

(a) *Anopheles maculipennis*, the malaria-carrying gnat, does not, as a rule, if ever, pass the winter in the larval stage, and, so far as is known, does not, in the strict sense of the word, hibernate as an adult. The females prefer, even if it is not their invariable custom, to winter in occupied cowsheds, stables, etc., which promise continued food, warmth, and humidity (owing to the presence of animals) throughout inclement seasons.

(b) *Anopheles bifurcatus*, however, so far as is known, hibernates in the larval stage.

(c) These habits of the insects make it easy to attack them. They can be driven out in hundreds, and each one driven out will probably die before it can find shelter again.

Hunts organised for this purpose will be found to yield productive results.

(d) During summer, when the larvæ appear in ditches, swamps, ponds, pools, streams, etc., they may be considerably diminished by clearing such ditches, etc., of weeds and leaving them open to attack.

(e) If the reasons for the investigation and extermination of *Anopheles*, and the benefit accruing through success, were explained to farmers and other agriculturists, gardeners and land-workers, observers would, in all probability be assisted in their work, and interest, even enthusiasm, in many cases, might be aroused.

(f) While no need for immediate alarm exists, precautions must be taken at once against the possible spread of malaria in this country by *Anopheles* mosquitoes consequent upon the return of so many soldiers who have contracted the disease abroad.

(g) Information is also wanted as to the life-history of larvæ in all stages of their existence. All who can give such information are very earnestly invited to do so.

To enable beginners to share in the investigation, it is proposed to